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ABSTRACT

The transformation of Singapore from a stagnating colonial port city in the late 1950s into a newly industrialized city-state in the early 1990s was the outcome of planned adjustments to changing internal and external conditions. Training and retraining programs played a role in these adjustments. Although full employment prevailed in 1979, the government was concerned about the labor displacement impact of its restructuring program. Beginning in 1980, both the Institute of Technical Education and the National Productivity Board developed a variety of adult education programs to meet the diverse education and training needs of workers. Six were of particular importance to the industrial restructuring strategy: Basic Education for Skills Training, Worker Improvement through Secondary Education, Modular Skills Training, Core Skills for Effectiveness and Change, Training Initiative for Mature Employees, and FAST FORWARD. Their positive contributions were a shift to a more highly skilled work force, rise in average wages, full employment, and alternative employment for workers affected by structural change. Lessons from Singapore's experience include the following: a flexible, responsive training system that facilitates skill acquisition; the development of effective institutions to guide the establishment of an employer-based training system as part of a total human resource development strategy; and Singapore's approach to problems which combines a strong belief in state action and a belief in market forces and competition. (Appendixes include 25 notes and 4 tables. Contains 19 references.) (YLB)

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Training Policy Studies

Industrial restructuring and retraining in Singapore

by Pang Eng Fong and Low Chee Kiat

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Introduction

The transformation of Singapore from a stagnating colonial port city in the late 1950s into a newly-industrialised city-state in the early 1990s is the outcome of planned adjustments to changing internal and external conditions. Many factors including an activist state, market-friendly policies, and investments in physical and human capital contributed to the success of the city-state's successful adjustments. This paper assesses the role training and retraining programmes played in these adjustments, especially after 1979 when Singapore embarked on a restructuring programme to move its economy away from low value-added, labour-intensive activities. Although full employment prevailed in 1979, the government was concerned about the labour displacement impact of its restructuring programme. This paper also discusses the policies it instituted to minimise this impact and the lessons that can be learnt from Singapore's experience.

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I. Development strategies and industrial restructuring

The thrust of Singapore's development strategies since 1959 when it was granted self-rule has changed several times. From 1959 to 1965, the emphasis was on the domestic market and on industries that could capitalise on the island's location and abundant labour. During this period, Singapore's development strategy hinged on access to an enlarged domestic market which included Malaysia. When Singapore left Malaysia in 1965, it had no choice but to abandon its import-substituting industrialisation strategy. Even though industrial progress was slow during this period because of labour unrest and political uncertainty, economic diversification did take place. Besides the establishment of oil refineries, there was a flow of garment firms from Hong Kong. The government also played a part in the diversification by investing in new industries to spearhead the industrialisation drive.

After 1965, the government's overriding objective was to promote export manufacturing to expand the economy and create employment opportunities. To realise this objective, it invited foreign firms to establish themselves in Singapore, offering them generous incentives. This strategy of relying on foreign capital and expertise to extend Singapore's economic ties with industrial countries succeeded because the government was able to ensure political stability and low labour costs at home, and because of favourable conditions abroad. In the late 1960s and early 1970s, Singapore capitalised on the boom in world trade. It also took advantage of multinational firms search for low-cost production sites. Its economy expanded by 13 percent a year, led by manufacturing exports which rose by more than 20 percent a year.

Success in export manufacturing and the emergence of full employment in the early 1970s prompted the government to promote higher value-added activities and less labour-intensive investments. But this upgrading policy was not followed through because of the 1974-75 world recession which slowed growth in Singapore and refocused policy attention on employment creation.

From 1974 to 1978, government policies were aimed at promoting a high rate of economic growth and ensuring full employment. These policies were highly successful. By the late 1970s, labour shortages were widespread adversely affecting productivity growth and reliance on foreign labour rose rapidly.

During this period, the economy diversified further with the expansion of the traded services sectors, especially transport and communications, finance and business services, and tourism. By the end of 1970s, the GDP share of manufacturing had risen to 24 percent from 13 percent in the mid-1960s (see Table 1). In 1980, manufacturing was the largest employer, with 30 percent of the workforce of 1.1 million people.

As the manufacturing sector expanded in the 1970s, its structure changed. In the mid-1960s, before the influx of foreign firms, food and printing and publishing were the two largest industries. By the end of the 1970s, the major industries were petroleum refining, transport equipment (principally shipbuilding and repair), and electrical and electronic products. Together they accounted for two-thirds of the sector's manufacturing value-added. In the 1970s, manufacturing exports grew by over 20 percent a year. In 1980, they were more than 100 times the level in 1965.

In 1979, the government, recognising the need for industrial restructuring, introduced new policies to hasten Singapore's transformation into an economy based on the export of high value-added goods and services. Both internal and external factors made restructuring

an urgent task. Internally, labour shortages were expected to become more severe because of the diminishing pool of new labour force entrants. Also, there was a need to create more skilled and better paying jobs to meet the rising expectations of workers whose education and skill levels were rising. Externally, Singapore faced the threat of growing protectionism in developed countries and increasing supply-side competition from lower-cost countries.

The government's drive for a "New Industrial Revolution", as the restructuring strategy came to be called, had four related policy components: new investment incentives to hasten the development of priority industries; a vigorous investment promotion programme to attract high value-added activities; a major expansion of training and educational facilities to raise the skill level of new labour force entrants and workers in industry; and a wage correction policy designed to restore wages to market-clearing levels. Of these policies, only the wage correction policy was really new, representing a bold and controversial attempt to raise labour costs rapidly and so reduce the demand for unskilled labour. The others had been tried before. The difference after 1979 was the scale and urgency with which the government pursued these policies.

The wage correction policy was implemented by the National Wages Council (NWC), a tripartite body set up by the government in 1972 to ensure orderly wage changes. While it resulted in labour cost increases of about 20 percent in 1979-81, it also slowed employment growth, raised productivity gains and did not reduce foreign investment inflows. Though the wage correction policy ended in 1981, wages continued to rise strongly from 1982 to 1984, outstripping the wage increases recommended by the NWC. High wage expectations created in 1979-81 together with the tight labour market made it difficult for employers to resist pressures for high wage increases in 1982 to 1984.

The current phase of Singapore's industrial restructuring began in 1985 when the economy plunged into an unexpectedly severe recession and contracted by 1.6 percent. Internal as well as external factors contributed to the recession. Externally, Singapore's exports, especially of electronic products, fell because of slower growth in developed countries. The collapse of oil prices reduced the demand by its oil-producing neighbours for Singapore's goods and services. Internal factors also played a major role. The end of a construction boom (which lifted economic growth rates in the early 1980s but created a huge over-supply of all types of properties by 1984), a strong Singapore dollar, and, more controversially, deflationary monetary and fiscal policies aggravated the impact of weak external demand.

To revive the economy, the government introduced a package of cost-cutting measures. These included a wage restraint policy (which was relaxed in 1988), a cut from 25 percent to ten percent in the employer's contribution rate to the Central Provident Fund (a forced savings scheme), and reduced charges by government bodies. With rising external demand and a growing volume of foreign investments by local and foreign firms, these measures helped revive the economy. Recovery was patchy in 1986, but in 1987 and 1988, GDP growth was strong, averaging 7.2 percent a year. Since 1988, the economy has continued to expand by about seven percent a year, thanks to a steady influx of foreign investments seeking to capitalise on Singapore's excellent physical and human infrastructure, strong regional growth, and the further diversification of the economy away from low value-added activities. Labour shortages have worsened despite the relocation of labour-intensive firms to neighbouring Johor and the Riau Islands, and the inflow of foreign workers, skilled as well as unskilled, has continued to rise.

Since the 1985-86 recession, more emphasis has been placed on the role of the private sector as an engine of economic growth. But this emphasis does not signal a shift to a more laissez-faire economy. The government still believes it has a vital role to play in setting directions for the economy, in developing infrastructure and manpower, and

in encouraging R&D. As in the 1960s and 1970s, its economic and regulatory policies are designed to support, not supplant, the working of market forces.

Since the late 1980s, the government has sought ways to enhance the economy's competitiveness and flexibility through forward-looking, long-range planning. The attention it gives to education and training is part of this planning orientation. A Strategic Economic Plan (SEP) it prepared envisions the island attaining "the status and characteristics of a first league developed country within the next 30 to 40 years" (Ministry of Trade and Industry, 1991, p. 2). Besides the SEP, there is also a National Technology Plan (NTP) whose main aim is to raise R&D spending from 1.0 percent of GDP in 1990 to five percent by 2000. A National Science and Technology Board (NST), formed to carry out this plan, will support industry-driven R&D in the private sector with grants from a US$3 billion R&D fund.

II. Restructuring and manpower planning

Since it came to power in 1959, the government has recognised the importance of education and training to economic development. In the 1960s, its efforts were concentrated on expanding the school system and ensuring labour discipline. But it did not succeed in greatly reducing the high attrition rate in the schools, in part because of unsettling policy changes and in part because Singapore's multicultural, multilingual environment compounded the learning problems of students whose home languages or dialects were different from those taught in school. Despite the government's strenuous efforts, the educational attainment of the workforce in the 1960s and 1970s did not improve much. In 1980, only 40 percent of Singapore's workforce had more than six years of schooling - a proportion that was much lower than that of Japan, The Republic of Korea and Taiwan, China, three ethnically homogeneous societies that place a premium on formal educational qualifications.

The low educational attainment of the workforce, however, did not retard Singapore's swift economic transformation in the 1960s and 1970s. In the labour-intensive phase of Singapore's development, the demand was mainly for low-skilled labour to perform routine industrial and service jobs, and Singaporeans, being adaptable and trainable, picked up the necessary skills quickly.

By the late 1970s, as the demand for skilled and professional workers rose in line with the increasing sophistication of the manufacturing and modern service sectors, it became plain to the government that an under-educated and under-trained workforce could undermine efforts to upgrade the economy and attract investments in skill-intensive industries. A major push, the government felt, was needed to increase the number of skilled persons entering the labour force and to improve the learning and job-related skills of workers. From 1980, it greatly expanded enrolments in educational and training institutions, especially those offering post-secondary and university courses. Increased attention was given also to educational quality and excellence. The school system was reformed to reduce wastage, partly by streaming students according to ability, and partly by improving the quality of teaching.

In 1979, when it launched the industrial restructuring programme, the government recognised that the shift to higher value-added activities and technological progress might displace some older or under-trained workers. To upgrade the skills of workers -- a matter that cannot be handled only by the formal education system -- and to minimise the labour displacement effect of technological change, the government set up a Skills Development Fund (SDF) in October 1979 to support the development of an employer-based training system. The Fund was established to address the particular training needs of workers with little formal education, that is, those workers most at risk of being displaced by industrial restructuring. To provide resources for the Fund, the government imposed a levy on employers equivalent to four percent of their payroll for workers earning less than S$750. The Fund gives grants to employers to conduct their own training or to send their workers to approved courses offered by public and private sector providers. To ensure that employers engage in serious training, it requires employers to bear as much as 50 percent of the training costs. In addition to training grants, employers are also given financial support to upgrade their operations and invest in new technologies.

The Fund forms part of the institutional framework the government has built to guide educational and manpower development in Singapore. In 1979, the government set up a Council for Professional and Technical Education (CPTE) under the Ministry of Trade and

Industry to coordinate the work of government ministries and agencies involved in education and manpower development. The Council projects requirements for engineers and other professionals, technicians and skilled workers, and recommends enrolment targets for educational and training institutions including the two universities, the polytechnics, the Institute of Technical Education (ITE), and the National Productivity Board (which administers the Skills Development Fund and various joint-industry training centres). Its projections are revised regularly to reflect new data and circumstances. As with physical infrastructure planning, the government's approach to manpower planning is proactive, anticipating future needs rather than reacting to emerging bottlenecks.

III. Training institutions and programmes

A. Training programmes

The two key government institutions providing continuing education and skills training in Singapore are the Institute of Technical Education and the National Productivity Board. The ITE's mission is to develop skills needed to support Singapore's economic and social progress. It trains young school leavers in technical and vocational skills, offers courses for workers already in industry, and conducts skill certification tests. The NPB has a broader mission than the ITE; it is involved not only in training programmes for all types of workers but also in spreading the productivity message to the entire population. In 1990, the NPB took over from the Economic Development Board, the government's investment promotion agency, the administration of the Skills Development Fund. This change has strengthened the links between the productivity programmes of the NPB and the training programmes of the SDF, especially those programmes aimed at poorly-educated adult workers likely to be affected by technological change.

Since 1980, both the ITE and NPB have developed a variety of adult education programmes, some of them jointly, to meet the diverse education and training needs of workers. Of these programmes, six are of particular importance to the industrial restructuring strategy because they address directly the training and retraining needs of a large proportion of Singapore's workforce, especially those with little formal education. The first is the Basic Education for Skills Training or BEST programme. The programme represents Singapore's biggest effort to fill the unmet education and training needs of workers with little formal education. Started in 1983, it teaches and certifies workers in English language and mathematics competency at the national Primary School Leaving Examinations (PSLE) level. Its aim is to provide workers who have not previously completed primary education with the English-language literacy and numeracy skills they need to go for skills training and for secondary education.

The second programme, the Worker Improvement through Secondary Education or WISE programme, was launched in 1987. A follow-up of the BEST programme, it creates learning opportunities for workers to raise their education level to that of a secondary school graduate. Successful completers of the WISE programme can take part-time courses leading to the award of an Industrial Technician Certificate by the Institute of Technical Education.

The third programme, the Modular Skills Training (MOST) programme, was developed in 1986 to give workers an opportunity to acquire new job-related skills through part-time, six-month modular courses. As with the two earlier programmes, its design benefited from employer feedback.

The fourth programme, also launched in 1986, aims to upgrade the skills of service workers. Called the Core Skills for Effectiveness and Change (COSEC), it develops the skills of junior-level service workers in six areas - communication, personal effectiveness, problem-solving, work economics, computer literacy, and quality.

The fifth programme, Training Initiative for Mature Employees (TIME), addresses the training needs of workers over 40 years of age. It provides financial support for employers to encourage them to send older workers to TIME courses conducted by ITE during as well as outside normal working hours.

The last programme, FAST FORWARD, was launched in 1990. It targets workers with

little non-working time to attend classes and who want to upgrade their skills with the help of home video programmes. It is a flexible way to deliver training to groups such as shift and older workers who are not motivated to attend conventional skill upgrading programmes.

In addition to supporting these programmes, the SDF operates a Training Grant Scheme (TGS). The scheme provides employers with financial support for the acquisition by workers of skills needed for economic restructuring. The SDF does not conduct the courses itself, but gives employers grants to send workers to approved courses conducted by themselves or other trainers. One survey suggests that most firms do not assess their training needs systematically, but send workers for "relevant" training as and when necessary (Chen, 1992, p. 206).

The SDF also pays attention to the development of the infrastructure for training. It provides funding for the development of training materials, the certification of service-related skills, and the setting up of training centres. As part of its training infrastructure building efforts, it has introduced an Increasing Training Opportunities (INTRO) scheme to encourage employers to expand their training capacity and share their training resources with other employers. The NPB has partnered leading private companies to increase the number of trainers and training programmes.

B. Evaluation

The education and retraining programmes Singapore has introduced since 1979 were not the result of a grand strategy. Nor do they represent a sharp break from past policies and practices on educational and training investments. Rather they were pragmatic responses to emerging and specific gaps in the training market. The Skills Development Fund began with a general objective of expanding worker and employer involvement in skill upgrading. In establishing the Fund, the government's assumption was that left to themselves, employers, especially small employers, would under-invest in job training. Because training has many externalities, a large government role in job training was therefore imperative. In the early years, the approach the Fund took was to provide financial support for AIP (approved-in-principle) courses offered by public or private sector providers. This approach meant there was no relation between what a company contributes to the Fund and the training support it receives from the Fund. Nor was it designed to address the training needs of particular groups of workers or firms. The unmet needs of these workers led SDF to develop programmes like BEST, MOST, WISE and COSEC. Regular programme reviews and feedback from employers helped the SDF identify training gaps and led to the introduction of other programmes including COSEC, TIME and FAST FORWARD.

As a result of a major review in 1987, the SDF changed its grant guidelines to provide greater support for lower-level workers and for small and medium-sized firms. Prior to 1987, 70 percent of the funding the SDF provided went to support the training of managers and executives in large firms. Lower-skilled workers and small firms were therefore indirectly subsidising the training activities of highly educated workers and large employers. Since 1987, the SDF has restricted its funding support to workers earning less than S$750 a month or who have less than 12 years of schooling. (This wage ceiling was raised to S$1,000 a month in 1990 to reflect wage increases since 1987).

The rapid expansion of SDF programmes is revealed in its budget. Annual revenue from the levy on employers has fallen to less than S$17 million in 1991 from $112 million in 1982 because of the reduction in the levy rate. But grant disbursements have grown rapidly to S$67 million in 1991 (see Table 2). In 1991, the SDF committed S$89 million in training grants which amounted to 0.13 percent of Singapore's GNP. If privately borne training costs are added to this amount, the total cost of employer-based training rose to 0.5 percent of GNP.

The various programmes supported by the SDF have made a significant impact on the quality of Singapore's workforce. The cumulative number of training places in SDF-supported programmes has risen from less than 50,000 in 1983 to nearly two million in 1991, a figure that is one and a half times the size of the labour force. Over 320,000 training places for BEST students have been created since the programme was launched in 1983. In 1991, more than half the workforce with less than a primary education had attended at least one BEST course.

The expansion of training places has paralleled the shift to a more skilled workforce. The proportion of workers in the labour force without secondary education has fallen from 60 percent in 1980 to 47 percent in 1991 (see Table 3). Part of this decline is the result of a larger flow of better-educated new entrants into the job market. But part of it is also due to the completion of BEST programmes by older workers.

Feedback from employers who have sent workers to BEST courses is highly positive. In a survey by the Vocational and Industrial Training Board in May 1988, nine out of ten employers said workers who have completed BEST courses have become better and more efficient. BEST courses have also increased the interest of workers in education and training. About a third of the workers who completed BEST courses have enrolled in higher-level training courses or in secondary education courses.

Almost all firms employing more than 50 workers have benefited from SDF training grants, and the number of small firms with SDF training grants is rising rapidly. In 1991, 15 percent of all firms employing less than ten workers had sent workers to SDF-supported training programmes. The SDF expects that by 1995, one out of five firms employing less than ten workers will be receiving training support.

About a third of the workers who have received SDF-supported training in recent years are aged 30 and above (see Table 4). Seven out of ten SDF-supported training places are given to workers with ten or fewer years of schooling.

Most of the trainees the SDF has supported have attended courses that provide general rather than job-specific training. In theory, workers should bear the cost of such training as they benefit most from it and the skills they learn are transferable. The SDF chooses to support such training for two reasons. First, there are enormous external economic and social benefits to society from financing the general training of workers. Second, it cannot depend on employers to invest in general training because labour mobility makes their returns from investing in such training highly uncertain.

There have been no cost-benefit studies of SDF-supported training programmes or of their impact on Singapore's industrial structure and competitiveness since 1980. However, their positive contribution can be inferred from a number of developments. First, the proportion of production, transport, and manual workers in the labour force has fallen from 46 percent to 44 percent, while that of professional and technical workers has risen from 12 percent to 16 percent. The expansion of training places for all types of workers by the SDF accounts for part of the shift to a more highly-skilled workforce.

Second, the average wages of production, transport and other manual workers rose by 8.4 percent a year between 1979 and 1991, only marginally less than the rate of 8.7 percent for all workers. This improvement suggests that in relative terms the wages of unskilled workers have not fallen behind those of other workers. The increasing access of unskilled workers to training played a part in this improvement.

Third, as the inflation rate averaged only 2.4 percent between 1979 and 1991, unskilled workers have enjoyed substantial real wage increases. These increases would not have occurred if their productivity had not increased.

Fourth, rapid economic upgrading since 1979 has not resulted in increased unemployment, except during the 1985-86 recession

when unemployment peaked at six percent. Since 1987, full employment has prevailed. In fact, the economy generated many more jobs than could be filled by Singaporeans, as a result of which Singapore's dependence on foreign workers has risen further.

Fifth, workers affected by structural change have been able to find alternative employment easily. The experience of workers in the textile and garment industry - an industry that faces severe adjustment problems everywhere due to import competition - provides a good example. In Singapore, as in many other countries, the industry is a major employer of labour, particularly female operators. Employment in the industry rose from 1,300 in 1960 to 39,300 in 1979, the year industrial restructuring began in earnest. As an established industry, textiles and garments have a much larger proportion of workers over 30 years old than other labour-intensive industries like disk drives (which is the largest employer of female labour in the manufacturing sector). Average wages are consequently higher than those in other industries, even though starting salaries are lower.

From 1979 to 1985, employment in the industry contracted by a third, most of it occurring in textiles. The contraction took place smoothly. Labour unions, aware that the job shrinkage was a result of a drop in external demand and supportive of the government's strategy of continuous upgrading, did not pressure the government to preserve jobs in the industry. More important, local workers who left or were retrenched found jobs easily in other sectors. Laid-off foreign workers, mostly from Peninsular Malaysia, were repatriated, reducing the impact of the industry's contraction on local workers. In 1985-86, an additional 2,000 workers in the industry lost their jobs, but they were unemployed only for a short period because of the economy's swift recovery. Since 1986, despite shedding labour, the industry has been chronically short of workers, partly because of restricted access to foreign workers and partly because of its inability to offer wages and working conditions as attractive as those offered by other industries with better long-term prospects.

IV. Lessons from Singapore's experience

Singapore's economic progress since independence in 1965 has been exceptional, even by the standards of rapidly industrialising Asian countries. The internal factors that have contributed to its economic success include favourable initial conditions, an unwavering commitment to free enterprise and competition, openness to foreign investments, ideas and expertise, market-supporting government interventions, a pragmatic approach to long-term economic and manpower planning, and a high degree of institutional efficiency. These factors also explain Singapore's capacity to develop effective, market-oriented training programmes to minimise the disruptive effects of economic restructuring.

Because Singapore has a few distinctive characteristics, including a compact city-economy and a long history as an outward-looking free port, its experience with training programmes and structural adjustment must be seen in perspective. While this experience cannot be easily emulated, there are nevertheless useful lessons to be extrapolated from the way Singapore has designed and implemented training programmes to smooth the restructuring process.

A. Coordinated and flexible manpower planning

Singapore has not followed a formal five-year development plan since the early 1960s. But it has evolved a framework over the years to guide economic and manpower planning. The manpower plan is based on projected GDP growth targets and indicates enrolment targets for educational and training institutions. It is revised yearly to reflect feedback from surveys of employers and graduates.

The SDF forms part of the institutional framework Singapore has built to upgrade its economy and maintain its international competitiveness. The distinctive feature of this framework is not the structure or objectives of the institutions themselves but their approach to problem-solving and planning. Staffed by well-paid bureaucrats who understand and share the development goals of the government, public sector institutions in Singapore are effective and responsive. Their approach to planning is to implement programmes quickly and adjust them with experience, rather than to deliberate for a long time before acting. While this approach sometimes creates problems, it also means that the time interval between the appearance and diagnosis of a problem and the development of a solution is fairly short. The lesson here is not that other countries should design institutions similar to those in Singapore, but introduce incentives that encourage both politicians and bureaucrats to be flexible and pragmatic in their approach to problems. The institutions are only as good as the people in charge of managing them.

B. Integration of training programmes and restructuring

When the government established the Skills Development Fund in 1979 to support an employer-based training system, it already had considerable experience in organising and reforming the formal education and training system, and in working with the private sector on joint training programmes. This experience was invaluable when it set up the SDF to promote skill upgrading and minimise the job displacement effects of economic restructuring. The government saw skill training as essential to its restructuring and integrated the work of the SDF into its development programmes.

This integration was not achieved with a formal planning model but was developed by the Ministry of Trade and Industry which is responsible for economic planning. The Ministry works closely with the SDF (and other educational and training institutions) to implement the government's training targets, ensuring that it has the resources to carry out its mission.

In the early years, the problem the SDF faced was not a lack of financial resources but rather an underdeveloped demand for skill training and a weak training infrastructure. It had to work hard to develop training consciousness in firms and workers, and to encourage them to apply for training funds.

C. Promotion of retraining

Both financial and non-financial incentives are used to promote worker and employer interest in retraining. Over the years, the Singapore government has extended the range of tax incentives to workers and employers to participate in retraining. Financial incentives for employers include tax write-offs for training expenses as well as lower levies on the importation of skilled foreign workers.

The government through its various agencies including SDF has sought through periodic publicity campaigns to develop a strong training consciousness among employers, particularly small ones that spend less than one percent of their payroll on training. The impact of its highly-focused and sustained efforts is, however, difficult to assess independently of the impact of financial incentives. But there is little doubt they have helped to spread the message to employers and workers alike that continuous skill upgrading is vital to the international competitiveness of labour-scarce Singapore. Singapore's experience suggests that the promotion of retraining is more likely to succeed if adequate resources are spent to make workers and employers aware of the economic consequences of not investing in retraining.

D. Financing of training programmes

The government finances general education up to the tertiary level mainly through tax revenues. It chose, however, to raise funds for the SDF from a levy on payroll tax. In itself, such a method of financing training programmes is not unusual; many other countries also raise training funds from payroll tax. What is unusual is how Singapore put these funds to productive use. The SDF has never provided full financial support for approved programmes. Employers have to share the cost of sending workers to approved courses, their share depending on the usefulness of the courses as judged by the SDF. They had therefore to be more committed to training than if the courses were fully subsidised by SDF funds.

E. Design and management of training programmes

The SDF, as the main financial sponsor of employer-based training, does not conduct many courses on its own. It sets policy directions for training based on the government's development goals, identifies training needs, and approves courses offered by various private and public providers, and monitors the utility of these courses through regular feedback from participants and employers. While it plays a large role in broad programme design, it is not deeply involved in the design of specific courses run by firms themselves or offered by private providers that have sprung up to train workers in industry. It is thus more of an administrator and promoter of training than a provider or consultant of training to firms.

The SDF does not select course participants - that decision is left to employers. But it influences through funding support and programme design the types of participants sent to training courses. SDF has always operated in a pragmatic and flexible way, responding to participant feedback and employer demands, and developing new programmes to meet new target groups. In this

way, it has supported a great variety of programmes that train workers in need of basic skills as well as workers in need of specific skill upgrading.

Like the people and firms it supports, the SDF has learnt from experience and become ever more responsive to changing conditions. Viewing its work as complementing that of other organisations, the SDF has avoided energy-sapping, distracting rivalries with other agencies also involved in training.

While its basic mission of promoting employer-based training has remained unchanged, the emphasis of SDF's training strategy has changed over the years. More and more attention is being paid to the training needs of less skilled workers and smaller firms. The various programmes - BEST, MOST, COSEC, WISE, TIME and FAST FORWARD - SDF has developed since 1983 reflect this shift in emphasis, and a growing awareness of the special training problems less skilled workers, older workers, and shift workers face.

The SDF has taken what may be called a total approach to employer-based training. It understands the need to promote a demand for training and to involve hard-to-reach groups in continuous skill upgrading. It does not favour any particular mode of training but it does set moving targets to be achieved by the various programmes it financially supports. Also, it has paid close attention to the development of skill standards and the certification of skills. Besides stimulating demand for training, the SDF promotes the development of an effective training infrastructure in cooperation with public agencies and private firms. Unlike similar agencies elsewhere, it has always had adequate resources to carry out its total approach to employer-based training. This sufficiency of resources has allowed it to pursue its training objectives vigorously.

F. The importance of complementary restructuring policies

Important though they are, retraining programmes must be seen as one element in a restructuring strategy. They cannot succeed if policies that promote high economic growth rates are not also pursued. In Singapore, fundamental economic policies have been sound. They have ensured a stable macroeconomic environment, promoted high value-added exports and investments in high-technology industries, strengthened the island's physical infrastructure, and improved the quality and flexibility of the school system. In the absence of these policies, the retraining programmes would not have been as effective in smoothing the path of restructuring. The lesson for other countries is that a pro-growth, market-friendly policy environment is critical to the success of retraining programmes.

G. The role of the private sector

While the government has played a leading role in determining the direction the economy should take, it has collaborated and cooperated with the private sector in many ways. It has assisted private industry groups to set up training institutes and centres. Private industry representatives sit with trade union officials on many government bodies, including the SDF, providing valuable feedback and advice. This system of tripartite representation involving government officials, the private sector, and trade unions has been important to Singapore's economic progress and social stability. It has made it easier for the government to gain support for its policies and to adjust them to suit new conditions.

V. Conclusions

Singapore's development experience suggests that a pragmatic but interventionist state is not inconsistent with a strong commitment to market forces. It differs from the Republic of Korea where strong government guidance has created world-class export-oriented companies while erecting many barriers against imports, and from Hong Kong where a policy of "positive non-interventionism" has allowed local entrepreneurs to flourish and capture significant market shares in a few industries including garments and electronics. But it shares with the other Asian economies, an outward-looking, trade orientation -- an orientation that has allowed all of them to learn and adapt quickly to the vagaries of world market demand.

Singapore's experience also suggests that a pragmatic, forward-looking state can create a flexible, responsive training system that facilitates skill acquisition and industrial restructuring. While its initial conditions of economic openness and small size are important to Singapore's economic success, they would have mattered little had the state not developed effective and flexible institutions to guide the establishment of an employer-based training system as part of a total human resource development strategy, What is distinctive about Singapore's experience is not the design, content or financing of its skill training programmes, but its approach to problems which combines a strong belief in state action with a passionate belief in market forces and competition. Other countries facing transition or adjustment problems may find it rewarding to look closely at this pragmatic approach.

Notes

[1] For analyses of Singapore's economic, social and physical transformations, see Sandhu and Wheatley (1989).

[2] For analyses of the factors contributing to Singapore's economic success, see Lim (1983), and Lim and Pang (1986), and Pang (1988). Statistical indicators of Singapore's rapid economic progress can be found in Table 1.

[3] For an analysis of the effects of this policy, see Pang (1985, pp. 21-31).

[4] For an analysis of the causes of the recession, see Ministry of Trade and Industry, 1986.

[5] See Pang (1992) for an analysis of Singapore's growing dependence on foreign labour.

[6] For a comparison of the educational profile of Singapore workers with other countries, see Table 3.

[7] For details of the restructuring of the education system, see Soon (1992, pp. 11-15) and Tham (1989).

[8] At four percent, the levy resulted in the government collecting much more funds that the SDF could disburse as training grants in the early 1980s. In response to employer complaints, the government lowered the levy rate to two percent in 1985 and then to one percent in 1988.

[9] These centres were started by the Economic Development Board, Singapore's investment promotion agency, in partnership with foreign companies and governments. Designed to produce trained workers in emerging skill areas, they have been important not only in helping Singapore attract foreign investors, but also in quickening the development of employer-based industrial training and formalising apprenticeship in Singapore.

[10] The establishment of training centres by the Economic Development Board in cooperation with foreign multinationals and governments to produce skilled manpower for priority industries reflects this approach. These centres, first established in the early 1970s, have introduced new courses and terminated old ones in anticipation of emerging skill needs. They train not only skilled craftsmen, but also offer upgrading training to workers in industry, and technical services to small and medium-sized firms.

[11] The Institute is the result of the restructuring in 1992 of the Vocational and Industrial Training Board (VITB) which took in students who had completed their secondary education as well as those who had not. The restructured Institute will enrol only students with at least ten years of basic education.

[12] The NPB and ITE have partnered the private sector to set up specialised training centres for several industries including hotel, textiles and garments, die-casting and construction. These centres conduct training and retraining courses for workers employed in industry as well as new labour market entrants.

[13] Singapore has four official languages - Malay (the national language), English, Chinese (Mandarin), and Tamil. English is the primary language of government, commerce and industry. Many older workers are literate in Chinese or Malay, but not in English.

[14] For foreign firms, the SDF training grants amount to about 30 percent of their annual training bill (Chen, 1992, p. 206).

[15] Internal instructors train about three-quarters of the workers who benefit from SDF grants. Most workers are trained in general but job-related skills.

[16] The survey (Chen, 1992, pp. 206-207) also finds that training costs range from one percent to ten percent of the payroll of firms depending on the size and technology level of the firm.

[17] This section is based on materials from the annual reports of the Skills Development Fund.

[18] In July 1993, the ITE announced the formation of a 17-member committee to review its programmes. The review will recommend new ways to reach out to the 340,000 unskilled workers who have yet to undergo retraining (Straits Times, 22 July 1993).

[19] Private sector spending on further education and training of workers was 1.4 percent for Japan in the early 1980s, 1.2 percent for the United States and 0.9 percent for Australia (OECD, 1993, p. 58).

[20] The results of the survey were reported in the Straits Times (Singapore), 15 July 1988.

[21] In the 1980s, productivity gains in Singapore averaged 4.8 percent a year (Ministry of Trade and Industry, 1993, p. xii). Many factors contribute to these gains. In the absence of detailed econometric studies, it is not possible to say how much of the increase in productivity is due to investments in plant and equipment, how much to improved managerial efficiency, and how much to a better-educated and trained workforce.

[22] In the 1987-1992 period, rapid growth created more than 60,000 jobs a year. New labour force entrants averaged only 45,000 a year. In 1992, largely because of the relocation of manufacturing firms to neighbouring countries, particularly the Riau Islands of Indonesia and the Johor state of Malaysia, manufacturing employment shrank by 13,100. But this shrinkage was more than compensated by employment growth in other sectors. Net job creation in 1992 was 31,300, about the half the volume in the previous five years (Ministry of Trade and Industry, 1993, Table A5.1).

[23] In 1990, there were 321,700 foreigners (excluding tourists) in Singapore (Pang, 1992, p. 496). Most of them are foreign workers; the rest are dependents of foreign workers and students. Foreign workers probably formed one-sixth of Singapore's workforce of 1.3 million in 1990 - one of the highest ratios in the world.

[24] For details of the industry's adjustments to internal constraints and external challenges, see Pang (1991, pp. 235-239).

[25] All post-secondary and tertiary institutions conduct regular employment surveys of their graduates. Constant monitoring of the labour market performance of their graduates allows them to adjust enrolment intakes into various courses quickly (Pang, 1982).

Tables

Table 1 Singapore: Real GDP, Industrial Structure and Employment, 1960-1990

	1960-69	1970-79	1980-90
Average growth (%)			
Real GDP	9.4	9.8	8.2
Employment	2.9	5.0	2.1
Industry contribution as % of GDP			
Agr & quarrying	3.4	1.9	0.9
Industry@	29.6	36.9	35.1
Construction	8.2	8.1	7.8
Manufacturing	19.6	26.9	25.4
Services+	67.0	61.2	64.0
Real average industry growth (%)			
Agr & quarrying	4.5	3.1	-3.3
Industry@	13.3	11.0	7.0
Construction	15.7	10.8	6.0
Manufacturing	13.0	12.2	7.4
Services+	8.0	9.4	9.1
Employment as % of total (%)			
Agr & quarrying	7.1*	2.5	0.9
Industry@	23.1*	33.0	35.9
Construction	5.7*	5.4	7.2
Manufacturing	16.1*	26.4	28.0
Services+	69.8*	64.5	63.2
Agr & quarrying	-11.7*	-4.4	-14.4
Industry@	8.1*	6.9	1.6
Construction	6.7*	2.6	1.3
Manufacturing	9.0*	8.0	1.7
Services+	2.5*	4.5	2.6

* Data for 1960-1966 only
@ Comprises utilities, construction and manufacturing
\+ Comprises commerce, financial and business services, transport and communications and other services.

Sources: Singapore, Department of Statistics, Singapore National Accounts, 1987; and Ministry of Trade and Industry, Economic Survey of Singapore, 1990.

Table 2 Training Costs, Selected Years, 1979-1991 (S$million)

	1979	1982	1985	1988	1991
Training Levy					
Collection	-	112	57	24	17
Disbursement	-	26	63	55	67
Commitment[1]	1	52	77	58	89
Training cost[2]	4	208	308	232	356
GNP (S$b)	20.4	31.8	40.3	49.9	70.7
Govt spending on education	557	1,358	1,775	1,604	2,869
Training cost as % of GNP	0.02	0.65	0.77	0.46	0.50
Training cost as % of Govt. educ. spending	0.7	15.3	17.4	14.3	12.4

Sources: SDF *Annual Reports*, various years; Department of Statistics, Singapore, *Yearbook of Statistics*, various years.

[1] Amount committed for various SDF schemes including Traoiing Grant Scheme, Basic Education for Skills Training (BEST) and Work Improvement thorugh Secondary Education (WISE).

[2] Based on the assumption that employers spend an additional S$3 for every S$1 SDF grant received by employers (Chen, 1992, p.202).

Table 3 Inter-country Comparison of Educational Profile of Workforce (% of Country's Total Workforce)

Educational Attainment	Singapore		Malaysia	Republic of Korea	Taiwan, China	Hong Kong	Japan	UK	USA
	1980	1991	1989	1989	1987	1990	1989	1990	1989
University	3	7	)	13	6	6	19	10	26
Post-secondary	9	15	) 5)	37	34	34	61	34	20
Secondary	28	30	48	20	20	23	)	19	40
Primary & below	60	47	47	30	40	37	) 20)	30	14

Source: Ministry of Trade and Industry, *Economic Survey of Singapore, 1992.*

Table 4 Number of SDF-supported Training Places by Age Group of Trainees

Age Group	1988	1989	1990	1991
< 20 training places	8,659	20,105	17,294	36,255
% of total	4%	7%	4%	9%
20 - 24	51,667	66,227	98,645	103,599
	22%	24%	24%	25%
25 - 29	80,424	85,251	129,553	117,161
	34%	30%	32%	29%
30 - 34	55,353	55,068	84,526	76,053
	23%	20%	21%	19%
35-39	28,215	35,105	45,701	45,527
	12%	13%	11%	11%
≥ 40	14,853	18,537	29,902	29,257
	6%	7%	7%	7%
Total	239,171	280,293	405,621	407,852

Source: SDF Annual reports

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